Strategy Research Project

# LEAN SIX SIGMA CHALLENGES AND OPPORTUNITIES

BY

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USAWC STRATEGY RESEARCH PROJECT

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## ABSTRACT

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The United States Army is in state of transformation as it meets current challenges and prepares for the future. On July 11th, 2005, the Secretary of the Army published a memorandum in which he stated that the Army is transforming the force structure to realize the Army Vision. He continued to say that the business end of the Army was vital to providing ready forces. Consequently, in order to provide responsive, innovative, and efficient institutional support for these forces the Army must transform the way it does business. This paper examines challenges and opportunities to implementing Lean Six Sigma (LSS) in the Army Acquisition Corps (AAC), which is a key part of the Army's business transformation. To provide a context for this examination, this paper first identifies current Department of Defense and U.S. Army business transformation policies. Then it addresses challenges for implementing LSS in the acquisition community, specifically discussing major sources of resistance to change and methodologies for overcoming these sources of resistance. From this examination, this paper discusses programmatic and organizational opportunities for implementation of LSS and concludes by providing recommendations for greater implementation of LSS into the AAC.

# LEAN SIX SIGMA CHALLENGES AND OPPORTUNITIES

On October 1st, 2001, the Department of Defense (DoD) released the Quadrennial Defense Review, which among its seven strategic tenants to achieve defense policy goals, identified that the need to transform defense was at the heart of this new strategic approach. As part of the review, institutional risk—specifically business management practices—was identified as an important area to address to ensure successful defense transformation. This Quadrennial Defense Review stated, "DoD will work to achieve a transformation in business practices, with a particular emphasis on financial management."[1] Four DoD questions of concern associated with the Quadrennial Defense Review to address business practices transformation included:[2] (1) "How are we arranged to conduct the business of the defense establishment as a whole?", (2) "What are the acquisition policies going to be?", (3) How are we going to work on financial management?, and (4) "How do we track our spending?" These key questions needed to be answered by the individual service secretaries during their quest for achieving business transformation.

Subsequent to the Quadrennial Defense Review on December 11th, 2001, President George H.W. Bush placed a priority on defense transformation stating: "The new world has new priorities. The first is to speed the transformation of the United States military."[3] This statement added further emphasis to the Defense Department's transformation initiative to better meet the current and future challenges of the changing global environment of the 21st Century.

Later, in Fiscal Year 2005, Congress passed the National Defense Authorization Act (NDAA), which directed DoD to develop and modernize all business systems.[4] To

support this directive, the Defense Business Transformation Agency was established with the following four strategic transformation objectives: (1) provide support for the joint warfighting capability of DoD, (2) enable rapid access to information for strategic decisions, (3) reduce the cost of defense business operations, and (4) improve financial stewardship to the American people.[5] Since the establishment of the Defense Business Transformation Agency, DoD has continued to make significant improvements in transforming business practices and processes to improve acquisition and financial management to better support the warfighter. To further increase the effectiveness of business process improvement and to accelerate the pace, DoD adopted Continuous Process Improvement (CPI)/Lean Six Sigma (LSS) as a methodology.

In the March 15th, 2007 Annual Report to the Defense Congressional Committees, DoD reported that employment of LSS methodologies resulted in significant savings and process improvements.[6] For example, by reducing unit cost using LSS methods, Navy realized a savings of over $133.5M across the 2006 Future Years Defense Plan and $421M over the life of the Joint Standoff Weapon Block II program. Army aviation reduced scheduled maintenance for helicopters achieving a 67% improvement in 'phase flow efficiency.'[7] Both of these were the result of 'leaning' organization processes through the implementation of LSS methodologies using process improvements. LSS successes such as these encouraged the Deputy Secretary of Defense to direct aggressive implementation of CPI/LSS at all levels of DoD and establish a new DoD CPI/LSS office to oversee these activities.[8]

To gain an appreciation of this defense initiative's impact within the Army, this paper will examine challenges and opportunities to implementing LSS in the Army

Acquisition Corps (AAC). To provide a context for this examination, it will first identify current DoD and U.S. Army business transformation policies. Then, it will address challenges for LSS implementation in the Army's acquisition community by specifically discussing major sources of resistance to change that are associated with complex organizations and various methodologies for overcoming these sources of resistance. From this examination, this paper will discuss programmatic and organizational opportunities to enhanced LSS's use and conclude by providing three recommendations that will enable the AAC to better implement LSS into its business processes to help achieve the Army's transformation objectives.

## Lean Six Sigma

Before examining DoD and U.S. Army business transformation policies, it is necessary to understand what is LSS and its associated methodologies as it is a key enabler to DoD's business transformation and continuous process improvement plan. Lean Six Sigma is defined as, "a systematic, rigorous methodology that uses metrics and analysis to drive continuous improvement of an organization's processes, practices, and performance."[9] It incorporates some of U.S. industries best business practices by focusing on 'leaning' the organization's processes to eliminate waste, improve quality and make efficient use of resources. By combining process improvement methods with efficient process disciplines, the implementation of LSS results in reducing delivery times, lowering costs, and increasing customer satisfaction.[10]

Lean Six Sigma and its associated methodologies have historical roots in U.S. and Japanese business successes. Historically, the industrialist Henry Ford could be considered the first major systemic 'lean' thinker. During the 1920-30's, Ford focused

on reducing waste (leaning in today's language) in the manufacturing process by analyzing every step in the process to see if it added value. If the step added value to the process, he improved it. If the step was wasteful, he eliminated it! Later, 'lean' was recreated by Toyota in the 1950's as part of their emphasis on quality improvements. Toyota focused on improving 'lead time' in the process. However, it was later found that 'lean' lacked a process that could be applied to produce expected results.[11] Consequently, the concept of 'six sigma' was later introduced to augment 'lean' principles. Motorola, who pioneered this later approach, was the first advocate of Six Sigma and it's methodologies in the 1980's. Six Sigma methodologies involve the use of statistical tools and structured problem-solving approaches to reduce variation in processes. The overall goal of this method was to improve performance and gain customer satisfaction. Combining the methodologies of 'lean' and Six Sigma resulted in a systemic approach to process improvement that reduces waste and variation, improves quality, and satisfies customers.[12]

The application of the LSS methodology includes five key stages: Define, Measure, Analyze, Improve, and Control (DMAIC). During the 'Define' stage, participants identify the process that will be improved using LSS methods. Two primary tools used during this stage are the SIPOC diagram and the Value Stream Map.[13] The SIPOC diagram is a tool for process improvement that identifies the suppliers, input, process, output, and customers (SIPOC).[14] The Value Stream Map is a tool that shows the entire process flow and displays actual process data. Analyzing the Value Stream Map can lead to identification of inefficiencies in the process that wastes time and effort.

The ‘Measure’ stage of DMAIC documents the measure of time or quantity of activities that occur at this stage of the process. Management tools such as process observation, Time Value Maps, Pareto and Time Series Plots are used during this stage.[15] Process observation refers to observing the process at each stage while Time Value Maps identify how much time is spent in the process. Pareto and Time Series Plots help identify more accurately where time inefficiencies occur in the process to provide a holistic understanding.

During the ‘Analyze’ and ‘Improve’ stages, data is assessed and areas identified for improvement.[16] Management tools used during the ‘Analyze’ phase include Scatter Plots and Cause and Effect Diagrams. During the ‘Improve’ stage, areas identified for improvement are formally evaluated for optimum benefit and some are then chosen to be implemented.

In the final ‘Control’ stage of the DMAIC methodology, the purpose is to ensure that benefits from the improved process are passed to the process owner. During this stage, all changes to the process are documented; people are trained in the new process; and learning is fully shared in the organization.[17] Various methods can be used to drive changes in the process, but of most importance is to continue the new improved process over time. With this brief explanation of LSS and its’ methodologies, we will examine DoD and U.S. Army business transformation policies to gain an appreciation for why this successful business management process was promoted as a essential element of Defense’s business transformation.

Defense Business Transformation

The Department of Defense is in transformation which is defined as more of a process rather than an end state, and one of the primary focus areas is business.[18] During the week leading to the 2001 QDR, DoD recognized the need for greater business improvement and began to effectively work to change business operations to be more lean and responsive. With the passage of the 2005 NDAA and later the establishment of the Defense Business Transformation Agency, DoD accelerated business transformation. It first established a Business Enterprise Architecture to ensure system integration and interoperability and then developed an Enterprise Transition Plan to monitor progress of transformation.[19]

The Enterprise Transition Plan highlights the following five core elements necessary to achieve transformation strategy, culture, process, information, and technology. Alignment of these five elements is critical to achieving the Department's four strategic transformation objectives. These objectives are: (1) providing support for the joint warfighting capability of DoD, (2) enabling rapid access to information for strategic decisions, (3) reducing the cost of defense business operations, and (4) improving financial stewardship to the American people.[20] As part of the change in the process core element of the Enterprise Transition Plan, the Deputy Secretary of Defense in a memorandum dated April 30th, 2007, directed implementation of CPI/LSS at all levels within the Department of Defense.[21]

Army Business Transformation

Prior to the April 30th, 2007 memorandum, the Department of the Army was already aggressively implementing CPI/LSS. On July 11th, 2005, the Secretary of the

Army, Honorable Dr. Francis Harvey, published a memorandum entitled, “Transforming the Way We Do Business.” In this memo, Dr. Harvey stated that,

> We are transforming our force structure to realize the Army Vision: ‘Relevant and Ready Landpower in Service to our Nation.’ The institutional activities that generate these ‘ready’ forces are the business end of the Army. In order to provide responsive, innovative, and efficient institutional support, we must dedicate ourselves to transforming the way we do business.[22]

This memo further outlined the vision, goals, and actions for implementing Army business transformation. Secretary Harvey established a senior leader to head a new business transformation office and empowered this office to oversee all aspects of Army business. He also set goals and plans for transformation that were identified in the 2007 Army Posture statement. The Army Posture statement “drives the plan, organization and work required to achieve the business goals, priorities, initiatives, and end-state described in the Army’s four overarching, interrelated strategies.”[23] Subsequent to the transition of Secretary Harvey, the new Secretary of the Army, Honorable Pete Geren, confirmed the 2007 Army Posture Statement established by Secretary Harvey, emphasized the need for continuous improvement through LSS, and validated the Army transformation plans.

As identified in the 2007 Army Posture Statement the strategy to implement this includes “changing how we conduct the business of the Army—finding ways to improve, to increase productivity, and to maximize the use of every dollar.”[24] Changing how we conduct the business of the Army includes streamlining Acquisition processes, while ensuring responsible and accountable actions are aligned with affordable and predictable outcomes.[25] One of the challenges in managing the acquisition of systems is the problem of requirements creep, where additional items are added to systems,

while funding decreases during the budget year being executed or in later years. To mitigate this challenge, Army's business transformation program has four priorities focused on filling the gap between increasing requirements and decreasing funding. These priorities are: "(1) reduce institutional resource requirements to grow an enabled modular force, (2) improve the quality, speed of responsiveness, and value to customers internal and external to the institution and operational forces, (3) optimize installations, facilities, and caring for Army families and soldiers, and (4) improve overall Army enterprise value stream cost, quality and speed."[26]

The Army's plan for executing LSS is based on a multi-year, phased deployment plan. This plan began with an initial LSS deployment workshop in FY06 and continues beyond FY12 with actions and milestones to sustain the effort. The plan has three overall phases of strategic implementation: Phase I—Design and Build Initial Deployment Infrastructure; Phase II—Build Skills and Execute Projects; and Phase III—Integrate and Sustain the Effort.[27]

To facilitate the implementation of LSS within organizations, the Army is implementing the LSS methodology of using a 'belt' concept to identify roles and individual levels of experience and knowledge. When LSS was developed in the 1980's, the Karate practice of having different colored 'belts' to indicate different levels of mastery was created.[28] Using this concept, employees within the Army can earn Master Black Belt, Black Belt, and Green Belt status. Master Black Belt, the highest level of proficiency, indicates the individual has completed all LSS instruction, has successfully completed complex projects at the Green and Black Belt levels, and is able to teach other LSS students.[29] Black belt indicates the individual has completed all LSS

instruction and successfully completed LSS projects at the Green Belt and completed a complex project at the Black Belt level. Green Belts are six sigma team leaders who have received class-room instruction and successfully managed smaller scoped, less complex LSS projects from concept to completion.[30]

To date, much has been accomplished since the Army began implementation of LSS. The Army established a business transformation office with senior leadership, instituted a new Program of Instruction (POI) within Training and Doctrine Command (TRADOC) to train employees, and deployed Master Black Belt resources to project offices. The Army business transformation office deployed a centralized tracking tool for LSS project accountability and is actively tracking over 2,029 Army projects for completion.[31] As of January 2007, the Army had over 1044 executive leaders and project sponsors trained, awarded 100 Black Belt's and 383 Green Belt's, and completed 114 LSS projects.[32] And, on August 3rd, 2007, the Army graduated the first fifteen LSS Master Black Belt graduates who will "...provide the institutional foundation for process management, improvement efforts, and a generation of innovation."[33]

Lean Six Sigma Implementation in the Army Acquisition Corps (AAC)

The AAC is implementing LSS in accordance with the overall Army LSS multi-year, phased deployment plan just described. To provide secretariat, Acquisition level support of Army business transformation, Lieutenant General Ross N. Thompson, Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, stated:

> One of the Army's major priorities is to make business transformation a reality. Business transformation is about challenging and/or changing the current way we do business. The Army has chosen to use Lean Six Sigma and its disciplined methodologies to transform business operations.

> I expect the Acquisition, Logistics, and Technology (AL&T) Workforce to embrace Lean Six Sigma in business transformation. I also expect senior leaders to be sponsors of process improvement events. LSS provides...a way of tackling problems and solving issues that is very well proven.[34]

During the initial phase of LSS deployment—design and build initial deployment infrastructure—senior Acquisition executives were identified to receive LSS training. In conjunction with Phase II in FY06—build skills and execute projects—senior Acquisition executive leaders received LSS training, and project sponsors led LSS deployment within AAC project offices. Most recently, in Phase III—integrate and sustain the effort—the Acquisition Corps is now producing 'belted' employees from its internal workforce.

The influence and application of LSS principles and projects have resulted in areas of improvement related to personnel, information management, organization, cost estimation, and acquisition process metrics. Applying LSS principles to the conversion of civilian employees to the National Security Personnel System (NSPS) enabled the transition of 1400 workforce employees to the new business process.[35] Implementation of LSS related concepts and projects resulted in the development of several web-based applications leading to streamlined Acquisition certification processes accessible by the workforce. Organizationally, the AAC is analyzing infrastructure and its processes to streamline activities while eliminating redundancies and waste. In concert with DoD, the AAC is performing Value Stream Mapping of the cost estimating process to streamline the cost process.[36] Finally, it is researching a measurement system that will capture critical acquisition process metrics. This system will be used to measure outcomes and process to improve the management of systems and eliminate unnecessary documents and meetings.[37]

Challenges to Lean Six Sigma Implementation

Although the AAC has made great strides in the implementation of LSS as just described, a primary challenge for further success is overcoming the normal institutional resistance to implementing changes of such a large magnitude. Scholars who have studied challenges of organizational change in large organizations have identified three broad sources of resistance: (1) fear of change in organizational culture, (2) failure to recognize the need for change, and (3) permitting obstacles to block the vision.[38] These three areas of concern, which are briefly discussed below, are relevant to the AAC's widespread implementation of LSS.

The first source of resistance experienced by many organizations is the fear of change, which can be part of an organization's culture that may not be readily visible. The LSS implementation is viewed as a challenge by some, due to the fundamental change in the way program managers at all levels must think about and do business—which is related to an organization's culture.[39] According to Edgar Schein, noted author who coined the term 'corporate culture,' organizational culture is defined as "shared values and beliefs that underlies an organizations identity."[40] Lean Six Sigma requires a change in organizational culture, as it is clearly not just a short-term initiative!

The incorporation of continuous improvement, eliminating waste, and reducing costs, i.e., 'leaning the process' must become the new cultural mindset and norm within the Corps. The LSS techniques employ a common way of addressing problems by combining principles of 'Lean' manufacturing that reduce non-value activities, with Six Sigma principles of reducing variation and increasing quality.[41] The integration of these methodologies is intended to result in quality service as defined by the customer, within a set time limit. Consequently, program managers must now have an attitude of

continuous improvement. That is, all program activities must be continuously evaluated in terms of efficiencies and effectiveness, while supporting the customer and reducing costs. It is no longer the traditional attitude of "just complete the mission." Rather, mission accomplishment must now be coupled with a business attitude that answers the following two questions: (1) Is the customer satisfied?, and (2) Did we improve the process while reducing costs?

Consequently, program managers must implement continuous improvement methodologies and techniques in all programmatic areas. Metrics for successful program managers include continually driving down costs, maximizing the return on taxpayer's dollars, reducing cost and cycle time, and improving quality.[42] Second, program managers must not only embrace these business practices and implement them in their daily operations, but they must also be sponsors of process improvement events. And as sponsors, program managers are encouraged to use their workforce as members of LSS projects to transform their own internal business operations. The result is continual improvement in daily business practices—which eventually leads to a reorganization to then achieve greater process improvement and cost efficiencies. Thus, LSS requires a fundamental change in organizational cultural mindset, attitude and behavior that must occur to fully accomplish the objectives of the sustainment phase of LSS implementation as an organization's culture then anchors change.

The second source of resistance—failure to recognize the need for change—is another challenge. Some contend that the current acquisition process is not broke; therefore, 'if it ain't broke, don't fix it!' Without workforce 'buy-in' at many levels, pockets of resistance can derail the implementation of LSS methodologies. Some may see LSS

as just another passing ‘quality management fad’ that only serves to interfere with the traditional organizational culture and ways of doing things. Implicit in this type of employee mindset is organizational and business norms that are a part of established power relationships.[43] As these ‘rice bowls’ of power are entrenched within the organization, they can become pockets of resistance to business transformation. Consequently, it is essential that the entire workforce is made aware of current programmatic issues associated with LSS to better understand the need for change.

The third source of resistance—permitting obstacles to block the vision—will cause the workforce to feel disempowered to implement LSS methodologies and undermine change.[44] One obstacle to block the vision is organizational structure. As a result of the organization’s structure, there are established power relationships entrenched over time that become part of an organization’s culture, which can be difficult to explicitly identify. These power relationships can hinder organizational change. According to Dr. W. Warner Burke, author of *Organizational Change, Theory and Practice*, planned organizational change usually does not go as planned; “some people resist or even sabotage the process.”[45] Others may be hindered from increasing productivity because of narrow job categories. Compensation and performance appraisal systems can also hinder implementation by causing employees to choose between implementing the new vision or their self-interests.[46] Finally, leaders within the organizational structure may refuse to adopt the new vision and make demands contrary to the transformation efforts.[47]

Methods to Overcoming Sources of Resistance

John P. Kotter, one of the foremost authorities on leadership and change, authored a book titled *Leading Change*. In this book, Kotter suggests an eight-stage process to enable managers to institute major change within complex organizations and overcome sources of resistance. According to Kotter, successful change of any magnitude goes through these eight sequential stages.[48] They are: (1) establish a sense of urgency, (2) create a guiding coalition, (3) develop a vision and strategy, (4) communicate the changed vision, (5) empower broad based action, (6) generate short-terms wins, (7) consolidate gains and produce more change, and (8) anchor new approaches in the culture.

Kotter's first four stages for organizational change shift the organization from status quo to understanding the new vision and strategy.[49] Establishing a sense of urgency, creating guiding coalitions, developing a vision and strategy, and then communicating the changed vision, are all vital aspects to overcoming the expected initial resistance to change. Urgency brings understanding and clarification of the need for organizational change. Creating guiding coalitions are vital to leading the organization in change. Organizational leaders must role model and actively support the new vision and energize the strategy for implementation as passive leaders and managers do not energize change. Coalitions of empowered leaders who have expertise, credibility, and the trust of the workforce can drive the process to success.[50] Developing a vision and strategy provides direction and focus for the future of the organization. It communicates where the organization is going and, most importantly, why. Strategy then tells the workforce how they will achieve the vision. Through

strategic communication of the vision and strategy, a sense of urgency can also be communicated by explaining why change is necessary.

Kotter's fifth, sixth, and seventh stages involve introducing new methods, while step eight anchors them in the organization resulting in cultural change. By empowering employees for action, generating short term wins, and consolidating gains to produce more change, new methods are effectively implemented and produce results. Finally, anchoring the new methodologies into the organization produces organizational culture change that is critical to ensuring long term acceptance and practice of these new methodologies.

Although the AAC did not specifically adopt Kotter's sequential process, it is successfully executing actions that generally align with Kotter's stages. For example, elements of Kotter's stages one through four were all birthed in the Acquisition workforce when Congress passed the National Defense Authorization Act for FY2005. This statute forced the Department of Defense to transform its business practices. Currently, the FY07 National Defense Authorization Act, Section 804, Public Law 109-364 requires a biannual reporting requirement by DoD on the progress of Acquisition transformation in all services.[51] While DoD earlier established a Defense Business Transformation Agency to oversee all aspects of DoD business transformation, on April 30th, 2007, it also established a DoD Continuous Process Improvement/LSS Program Office within the Office of the Deputy Under Secretary of Business Transformation within DoD's Acquisition, Technology and Logistics office to provide greater oversight for LSS implementation.[52]

Elements of Kotter's fourth and fifth stages are being implemented through the Army's leadership and guiding coalitions. Kotter states that, "Leadership defines what the future should look like, aligns people with that vision, and inspires them to make it happen despite the obstacles."[53] Kotter goes on to say that, "...successful transformation is 70 to 90 percent leadership and only 10-30 percent management."[54] The Army is demonstrating the validity of these assertions as they lead by example in creating the cultural environment for change and implementation of LSS principles and then empower the workforce to implement change. For example, the July 11th, 2005 memo from Secretary of the Army, Honorable Dr. Francis Harvey outlined the vision, goals, and actions for implementing Army business transformation. Most recently, Secretary of the Army, Honorable Pete Geren reinforced the Army's intent on using LSS methodologies stating that "...leaders were to complete workshops to understand their role and identify opportunities..."[55]

In consonance with Kotter's fifth stage, the office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology directed all subordinate program managers to have their organizations trained in LSS methodologies and begin implementation of LSS to realize efficiencies in programmatic areas. The vision and goals for implementation of Army Acquisition business transformation through LSS continue to be communicated through education opportunities, leadership off-sites, conferences, workforce meetings and professional publications and websites. And, to overcome any obstacles inherent in organizational structure, AAC is currently undergoing an organizational analysis to determine necessary changes to facilitate empowerment to the workforce to implement LSS activities. All of these activities are

guided by senior AAC leaders who role model the implementation of LSS principles in their daily job and have an established guiding coalition to oversee the new vision implemented within the Corps. Both the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and his military deputy, lead in promoting the cultural environment for change by their example.

Elements of Kotter's sixth and seventh stages are evident in Army Acquisition related programs. For example, the Red River Army Depot recently implemented LSS manufacturing principles to overhaul its Humvee recap process. Production increased from 12 to 200 vehicles per month.[56] These improvements in production quantities, as well as time management and other factors, resulted in the Red River Army Depot receiving the Silver Shingo Prize for Excellence in Manufacturing. The Silver Shingo Prize is given for achievement in implementing lean systems into processes.[57] News of this achievement was published in the recent Army Acquisition, Logistics and Technology magazine for the entire Acquisition community.

Elements of Kotter's eighth and final stage are realized through organizational cultural changes role that are modeled by leaders, enforced through member development, and implementation within Program Manager offices. While senior leaders define the organizational culture and role model desired behaviors, subordinate leaders emulate these behaviors and implement senior leader desired outcomes for the organization. According to Edgar Schein, "cultures change by the example of top management...and...new values will be incorporated into basic assumptions only after they have proved their worth in terms of desired organizational outcomes."[58]

As Program Managers and their workforce members are trained in LSS, cultural change occurs in daily communication and actions of the workforce. For example, program management offices now routinely speak in terms of cost efficiencies and 'leaning' the process for greater effectiveness, which was not routinely part of the conversation before this business transformation. Awards are given to those offices who have achieved the greatest success implementing LSS, and many offices willingly compete for recognition using LSS methodologies. These actions help to anchor the new methodologies into the culture, effectively changing the way people think about and do Acquisition business practices. Collectively, as realized in the examples above, the AAC is implementing many actions aligned with Kotter's eight step process that overcome organizational resistance to LSS.

Future Opportunities for Lean Six Sigma Implementation in the Army Acquisition Corps

Although great strides have occurred in the initial stages of each phase of LSS implementation, there are future programmatic and organizational opportunities for implementation. As of December, 2007, the AAC completed 42-LSS projects, with other 55-LSS projects on-going.[59] While this is a significant achievement, the potential for LSS projects in the AAC is so much more! For example, there are approximately over 170 major weapons system programs, each having subordinate product level programs.[60] And, in each of these programs, people, process and technology are all valid areas of focus for continuous improvement, elimination of waste, and reduction of costs.

Another area of opportunity lies in AAC support of the Army Forces Generation (ARFORGEN) process. The ARFORGEN process "is the structured progression of

increased unit readiness over time resulting in recurring periods of availability of trained, ready, and cohesive units."[61] According to the ARFORGEN model, Army units are assigned and organized according to mission requirements and have the capabilities and depth to conduct sustained operations. Resourcing and material prioritization support the ARFORGEN model as its goal "...is to generate combat power on a sustained cyclic basis more effectively and efficiently."[62] According to the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, it "...is one of the most fundamental changes that the Army has undertaken...and it allows the AAC, from an equipping perspective, to tie cycles of modernization and upgrades for equipment to the ARFORGEN process."[63]

In March 2007, Army G-3 asked for collaborative support to improve ARFORGEN processes that were critical to business transformation and to long-term development of an expeditionary Army.[64] In support of ARFORGEN, all core Army functions, to include equipping and capabilities support, should be aligned to meet ARFORGEN objectives. AAC potential LSS project areas that support ARFORGEN include Army Contracting Agency acquisitions and all efforts associated with the Army cost process.[65] Thus, all Army Acquisition related areas that support ARFORGEN must align with ARFORGEN objectives, and all are opportunities for LSS implementation.

Another area of opportunity for LSS implementation regards organizational analysis. Over time, organizations can become bureaucratic as people and processes become more rigid. This rigidity results from employees becoming entrenched over time as a result of established power bases within the structure. People also obtain new roles as special projects are created. On successful completion of the project,

however, the new role does not disband. Instead a new position results and another layer of bureaucracy is added to the structure. Consequently, organizations eventually have overlap and redundancy in their structure. Organizational analysis is a LSS related method that provides framework to assess the infrastructure and organization for work and positions that do not add value to the organization. Conducting this type of analysis within the AAC can eliminate non-value added work, align functions to strategic objectives, and establish the appropriate number of organizational layers.[66]

Recommendations

Based on this examination of LSS with the AAC, the following are three recommendations to enhance LSS's implementation in the AAC. Implementation of these recommendations serve to create a culture of change to better enable and anchor long term success needed for business transformation.

The first recommendation is to improve strategic communication through an enhanced LSS awareness training. This recommendation links to Kotter's fourth and fifth steps. Kotter stated that leadership must define the vision, align people with the vision, and inspire them to make it happen despite the obstacles. Consequently, AAC leaders must continue to sell the vision through various media and motivate people to willingly accept LSS by communicating through 'awareness training' which emphasizes the vision, strategy and utility of LSS implementation. Awareness training can occur through various media to include mandatory web-based training via the internet or short one-day LSS events that could be held in concert with specific employee recognition events where they successfully implemented this methodology. This training should be

focused on providing senior leaders a forum to communicate the ‘goodness’ and reason for this new initiative along with success stories to inspire its people.

People do not truly change until they believe in the cause. When belief changes, thinking changes and actions follow. Consequently, they must become ‘believers’ in LSS, then ‘buy in’ toward the new vision will follow. The intrinsic value will also motivate buy-in. People change when something is in it for them! Why should the Acquisition workforce change? Why accept the new philosophy? Awareness training may not ‘sell’ LSS to everyone, but at least the workforce can understand the reason for the implementation. Educate and train to make ‘converts.’ More important than intellect is the ‘heart’ buy-in! The end state will be a sustained organizational cultural change that will survive leadership turnover.

The second recommendation is to set expansive training quota’s for program management offices to educate employees on LSS methodologies. This recommendation links to Kotter’s seventh and eighth steps for change. Developing more people who will implement the changed vision will help promote a changed culture. Consequently, in future months, program management offices should identify more employees for Green Belt training. Encouraging greater levels of training beyond ‘awareness,’ will encourage the workforce to more fully embrace the initiative.

Finally, the third recommendation is to identify more LSS quality projects. This recommendation links with Kotter’s eighth step for change—anchoring new approaches in the culture. Since LSS the methodology has proven successful and with over 170 major acquisition system programs, program offices should now have to implement this methodology or identify why they could not. By making them identify “why not” versus

why, essentially changes a management paradigm and better anchors this in an organization's culture.

## Conclusion

Lean Six Sigma is a DoD directed initiative that is a determinant for success in transforming Government business practices and 'leaning' processes within the Army Acquisition Corps. It is a management discipline that causes leaders to look across the organization to determine customer's needs and link products to the user at reduced cost. It provides a mechanism that can transform organizations by making them more efficient and effective. Through the implementation of LSS methodologies of continuous process improvement, waste is eliminated and costs reduced. The outcome is quantifiable gains that in turn can be used to mitigate reduced budgets and fiscal spending.

This paper examined challenges and opportunities to implementing LSS in the Army Acquisition Corps. To provide a context for this examination, it first identified current Department of Defense and U.S. Army business transformation policies. This paper addressed challenges for LSS implementation in the AAC, specifically discussing major sources of resistance to change and methodologies for overcoming these sources of resistance. Sources of resistance included fear of change in organizational culture, failure to recognize the need for change, and permitting obstacles to block the vision. Suggestions for overcoming these areas of resistance involved using John P. Kotter's *Eight-Stage Process of Creating Major Change*. This research revealed that organizational change is occurring within the Acquisition Corps and LSS is becoming part of the Acquisition culture, due to the implementation of actions aligned with Kotter's

stages. These actions include: the establishment of law mandating business transformation; directives from the Secretary of the Army mandating use of LSS methodologies; leader example and role modeling; educating the workforce in LSS; and publishing immediate 'wins'—such as accolades given to organizations who have achieved success implementing LSS. All of these actions help to anchor the new methodologies into the culture and effectively transform the way people think about and execute Army Acquisition business practices. While much has been done, this paper concluded with identifying future opportunities and proposing three recommendations to capitalize on the existing progress and anchor LSS in the Army Acquisition Corps.

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